Do Analysts Fully Understand the Tax Implications of Foreign Operations?

by

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ABSTRACT

U.S. based multinational firms are able to use foreign subsidiaries as a means to reduce their overall tax burden. As disclosure requirements are vague, there is very little useful information provided to firm outsiders to analyze a firm's foreign operations activity and earnings. I demonstrate that even sophisticated financial statement users, financial analysts, have difficulty predicting the effective tax rate for firms with foreign operations, as evidenced by increased forecast errors for multinational firms as compared to domestic firms. I examine factors that may contribute to the increased difficulty of forecasting for multinationals and find that decreased ETR persistence and the presence of a loss may affect the difficulty of the forecasting task, but the presence or quality of management forecasts may not. The market finds tax forecasts important as evidenced by the positive response to the tax and non-tax components of earnings forecasts. This evidence is useful to investors, policy makers, and others interested in the tax activities of multinational firms.

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CHAPTER 1

INTRODUCTION

Many U.S. firms have been increasingly using foreign operations as a way to avoid paying U.S. corporate income taxes. Estimates suggest that more than 73 percent of Fortune 500 companies utilize tax haven subsidiaries to avoid paying U.S. corporate income taxes (ITEP 2017). This phenomenon has received a great deal of attention in the popular press and is of interest to regulators and investors alike (e.g., Barinka and Drucker 2014; Wood 2014). Research on analysts' use of tax information has presented mixed results. Some studies demonstrate that analysts are unable or unwilling to use tax information for their forecasting (e.g., Kim et al. 2015; Plumlee 2003; Weber 2009). In contrast, others demonstrate that analysts use tax information to improve their forecasts with the tax forecasts providing value-relevant information to the market (e.g. Bratten et al. 2017; Mauler 2015). Thus, as multinational firms are much more complex and have inconsistencies in the location and use of foreign earnings, analysts may have more difficulty forecasting for this type of firm. In this study, I examine analysts' ability to forecast the effective tax rate (ETR) for firms with foreign operations both inside and outside of tax haven countries.

Firms disclose the names and locations of their subsidiaries in Exhibit 21 of the Form 10-K. However, SEC Regulation S-K §229.601(b)(21) only requires firms to disclose *significant* subsidiaries, and firms have generally exercised discretion in determining which of their subsidiaries meet the SEC's definition of "significant.". Moreover, firms are not required to disclose detailed financial information for their operations in individual countries or even by geographic segment. Under ASC 280, firms

may define operating segments and present segment data using a basis other than geography (e.g. line of business). Firms are only required to disclose country-level data on sales and assets for *material* countries. Because the disclosure requirements are limited, most firms choose to disclose foreign operations in aggregate, limiting the amount of useful information to understand the specific geographic operations of the firm. Overall, limited financial disclosures create an opaque information environment with regard to foreign earnings and foreign cash holdings, two of the items most relevant to analysts in estimating ETR.

I hypothesize that analysts' implicit ETR forecasts for multinational firms will be less accurate than their forecasts for domestic-only firms. There is very limited useful disclosure by multinational firms of financial information for their foreign subsidiaries. Thus, analysts may not have clear information on how much is earned and where, what will be done with those earnings, and whether or not the earnings will be repatriated to the U.S. parent. These factors are all essential to accurate ETR forecasting. If analysts are unable to uncover this information, or are hindered by high information processing costs, then their forecasts for multinational firms will be less accurate than for domestic firms. However, this result is not immediately obvious as multinational firms tend to be very large, have relatively stable profits, and operate under a better information environment. Moreover, if multinational firms maintain a consistent year-to-year repatriation and income shifting strategy, their behavior should be less difficult to predict.

I test whether analysts' implicit ETR forecast errors are larger for multinational firms than solely domestic firms using a multivariate regression. I then test whether the effect on implicit ETR forecast errors differs for multinational firms operating in

countries designated as tax havens versus those operating in foreign countries not designated as tax havens. Firms operating in tax haven countries may have more to "hide" and may be less transparent in their reporting, making the job of forecasting their ETRs even more difficult. However, if firms operating both inside and outside of havens behave similarly as it relates to their reporting behavior and the consistency of their repatriation strategies, then there may be no significant difference in forecasting difficulty or the implicit ETR forecast error between these two types of multinationals.

After finding that the implicit ETR forecast error is greater for multinational firms than domestic firms, I conduct three tests to examine likely explanations for why the forecasting task may be more difficult for multinational firms. I examine ETR persistence, information environment as it relates to management voluntary disclosure, and firms with losses. First, I test the persistence of ETR to examine a potential source of the difficulty in forecasting for these multinational firms. Relative to domestic firms, multinational firms may have more mobile income and assets and thus more flexibility to shift income. Given their operations in multiple jurisdictions, multinational firms may also exhibit inconsistency in their earnings and repatriation processes. Shifts in the location of earnings, the tax rate locally applied to foreign earnings, or the firm's repatriation strategy could all contribute to less consistent ETRs. Thus, I hypothesize that the persistence of ETR will be lower for firms with foreign operations both inside and outside of tax haven countries. However, this is not altogether obvious as multinational firms may use their foreign earnings as a way to manage their worldwide tax costs, keeping ETR consistent from year-to-year, thus increasing the persistence of ETR.

Second, I conduct a test examining the information environment surrounding multinational firms as it relates to management voluntary disclosure. If managers of multinational firms are less likely to provide earnings guidance or if that earnings guidance is less accurate, analysts will have less quality information about the firm and this may lead to increased forecast error. In contrast, if managers issue quality forecasts, lack of information from management should not be related to the implicit ETR forecast error for multinational firms.

Third, I examine losses as prior literature has demonstrated that predicting earnings for firms with a loss is more difficult than firms with no loss. First, I look at the effect of losses on the ETR forecast accuracy for multinational versus domestic firms. Then, I look at the sample of multinational firms and examine loss firms more closely by separating the firm-year observations into those with a domestic loss, a foreign loss, or both a foreign and domestic loss. The presence of a loss may be one factor that leads to increased forecast error for analysts' ETR forecasts for multinationals.

Finally, I conduct a cumulative abnormal returns test to examine if the market reacts to the errors in the analysts' ETR forecasts. I establish a baseline with a test of the market reaction to earnings forecast error. I then separate earnings forecast error into a tax component and non-tax component and test these separately to examine if the market reacts differently to the two components.

I obtain data on foreign operations from the Compustat Historical Segments file, data on tax haven use from a hand-collected sample provided by Scott Dyreng, data on stock returns from CRSP, and data on analyst and management forecasts from I/B/E/S

from 2003 to 2016. As I/B/E/S does not capture analysts' explicit ETR forecasts, I form an implicit forecast by using analysts explicit pre- and post-tax forecasts.

I find that analysts' implicit ETR forecasts are less accurate for multinational firms relative to purely domestic firms. My results are consistent with findings in prior literature that analysts are either unwilling or unable to process complex tax information. In particular, I find that analysts struggle to process the limited information firms provide in their foreign operations disclosures as manifest in increased forecast errors of future taxes for multinational firms. Due to the limited disclosure requirements for foreign operations, firms generally provide little information on their foreign earnings and how they intend to strategically deploy foreign earnings. As a result, firm outsiders do not have a clear idea of how much a firm has earned in each country, what they intend to do with those earnings, and whether or not they will repatriate them. This information is all essential to forecasting firm ETR. I demonstrate that even sophisticated financial statement users like financial analysts have difficulty uncovering the information needed in the foreign operations disclosures to accurately forecast firm ETR.

In subsequent analyses, I find that for firms operating both inside and outside of tax haven countries, analysts' implicit ETR forecast error is larger relative to domestic firms, and that there is no significant difference in analyst forecasting ability between the two types of multinationals. This suggests that multinational firms, regardless of the tax haven status of their subsidiaries, behave similarly as it relates to the disclosure of their foreign earnings and the consistency of their repatriation strategy.

To look closer at why accurate forecasting is more difficult for multinational firms, I investigate the year-to-year persistence of ETR and find that for firms operating

both inside and outside of haven countries, the persistence of ETR is significantly lower relative to domestic-only firms. This provides evidence that firms are not using the foreign earnings of their subsidiaries to smooth year-to-year ETR. I also find that managers of multinational firms are more likely to issue earnings disclosures and that these disclosures do not differ significantly in accuracy from domestic firms. This suggests that the increase in analyst forecast error is not due to a lack of quality management disclosures. Lastly, I find that the effect of a loss on the difficulty of the forecasting task incrementally increases for multinationals and that for multinational firms the effect is greatest for a domestic loss. Thus, as in prior literature, analysts have more difficulty forecasting for loss firms, and this is especially true for multinational firms operating with a loss.

The cumulative abnormal returns test demonstrates that the market reacts to both of the components of the earnings forecast error but that the reaction does not differ between the tax and non-tax portions. Further, there is no incremental effect for multinational firms or firms operating inside a tax haven. The market responds favorably to a positive earnings surprise, regardless if the surprise is for a domestic or multinational firm. Moreover, the market responds favorably to a positive surprise in both the tax and non-tax components of earnings. A positive surprise in the tax component of earnings indicates the tax expense was greater than predicted. Some may view this not as a positive shock to the firm as it indicates the firm must pay more in taxes, leaving less cash available for investment, dividends, etc. However, it seems the market views this as a positive shock, a positive indication of the firm's performance and a positive indication of the firm's future performance. The positive response to both the tax and non-tax

components indicate the market is paying attention to this information and finds it relevant when evaluating firm performance.

I contribute to the literature on analyst forecasting ability, and more specifically to the growing literature on analysts' tax forecasts. I provide evidence that analysts' forecasts are less accurate for firms operating internationally, suggesting that analysts appear unable to digest or learn much from the foreign operations disclosure information provided by firms. It seems that the current disclosure requirements make it possible for firms to hide their foreign operations activities, even from sophisticated financial statement users. This suggests that unsophisticated users, like investors, would also be unable to accurately assess the future tax implications of foreign operations. Finally, my results demonstrate that analysts' forecast errors matter to the market as I find a significant market response to both the tax and non-tax components of earnings forecasts.

I also contribute to the literature on the taxation of U.S. multinational firms. Understanding whether an important firm intermediary, analysts, can interpret tax information is important, especially given growing use of foreign operations and growing concerns surrounding the lack of disclosure and the propensity for firms to "hide" earnings overseas. I provide evidence that under current disclosure requirements, firms do not provide sufficient information for even sophisticated users like analysts to interpret and predict the future tax implications of foreign operations activities. It appears this phenomenon is not driven by a lack of management earnings disclosures as multinationals are more likely to issue voluntary earnings disclosures, and those disclosures are of the same quality as disclosures from domestic firms. Moreover, the effect seems to supersede any proprietary information analysts are able to obtain from

their own networks and sources. Regulators seem to be aware of the potential challenges of the current disclosure requirements. In 2016, the SEC requested comments on Regulation S-K, which seeks to tighten these regulations.[1]

The rest of the paper is organized as follows. Chapter 2 discusses background and hypothesis development. Chapter 3 outlines the data, models, and research methodology used to test the hypotheses. Chapter 4 discusses the results and Chapter 5 concludes.

[1] For example, see: https://www.sidley.com/-/media/update-pdfs/2016/04/sidley-update-re-reg-sk-concept-release-april-2016.pdf

CHAPTER 2

BACKGROUND AND HYPOTHESIS DEVELOPMENT

Foreign Operations

Prior to the passage of the Tax Cuts and Jobs Act in 2017, the U.S. operated under a worldwide taxation system. This paper focuses on the setting prior to 2018 before the passage of this Act is likely to change firm incentives .[2] Under U.S. corporate tax law, the worldwide income of multinational firms based in the U.S. is subject to taxation in the U.S. at the federal rate. For example, if a U.S. multinational earns $100 in the U.S. and $100 in a foreign country, the whole $200 is subject to taxation at the 35% U.S. corporate income tax rate. Importantly, that $100 of foreign income may also be subject to taxation in the foreign country, independent of U.S. tax law. The U.S. provides a foreign tax credit for taxes paid on foreign income to foreign countries. So, if that same $100 was taxed in the foreign country at 15%, the U.S. would give the firm a $15 credit for those foreign taxes paid. Instead of a U.S. tax liability of $35 (35% x $100) on the $100 of foreign income, the firm would have a U.S. tax liability of $20 ($35-$15). Thus, foreign operations in countries with very low tax rates create the potential for even greater tax liabilities to the U.S. government, when foreign income is repatriated.

A second important caveat to the U.S. worldwide taxation system is that earned income from foreign subsidiaries is not taxed by the U.S. until it is repatriated to the U.S.

[2] The TCJA reduced the U.S. corporate income tax rate from 35% to 21% and moved the U.S. more toward a territorial-style taxation system (as opposed to worldwide) in which income is only subject to taxation in the country in which it was earned. It also instituted a one-time, deemed repatriation tax of 8% on accumulated foreign earnings (15.5% on aggregate foreign cash). Changes under TCJA may alter firm incentives related to foreign operations and income shifting but may not impact the forecasting task difficulty for analysts. Analysts may not be better able to predict future foreign earnings or a firm's repatriation strategy than they were prior to the passage of the TCJA.

Thus, profits kept abroad will not trigger any U.S. tax liability until the foreign subsidiaries remit their earnings to the U.S. parent via a dividend. U.S. Generally Accepted Accounting Principles (GAAP) provide an option within ASC 740 for companies to avoid recording a tax expense (and associated liability) for this potential future U.S. tax if the company designates their subsidiary's foreign profits 'indefinitely reinvested'. Prior research suggests these two treatments, deferral of U.S. tax on earnings in foreign subsidiaries and the ability to avoid recording a deferred GAAP tax liability for eventual U.S. tax upon repatriation explain, in large part, why U.S. multinationals maintain large amounts of foreign cash holdings (Foley et al. 2007). According to Moody's, U.S. multinationals have approximately $1.4 trillion in offshore cash holdings.[3] The prospect of incurring U.S. tax costs causes these cash holdings to be considered "locked-out" of the U.S. and only available for use overseas; ASC 740 requires firms designating earnings as 'indefinitely reinvested' to attest they have no intention of bringing the money to the U.S. The ability to avoid paying current U.S. taxes on income earned in foreign subsidiaries in countries with low tax rates has created an incentive for companies to shift operations and profits abroad and to keep those profits abroad.

Dyreng et al. (2017) demonstrate an upward trend in the multinationality of firms over time with only 40% of their sample considered a multinational in 1988 and nearly 70% in 2012. Correspondingly, they also find a decrease in the effective tax rate for these multinational firms over time. This is largely explained by a decline in foreign statutory tax rates. Many foreign countries have reduced their corporate income tax rates over time leading to an overall reduction in the tax liability on the foreign income of multinationals.

[3] http://money.cnn.com/2018/01/02/investing/us-tax-companies-overseas-cash/index.html

This downward trend in foreign statutory tax rates creates an even greater incentive for firms to engage in overseas operations and maintain cash holdings overseas.

Multinationals also use foreign operations to avoid paying U.S. corporate income taxes through artificial income shifting, shifting income from high tax jurisdictions (like the U.S.) to low tax jurisdictions (like a foreign tax haven) in an effort to reduce the firm's overall tax burden. This strategy is particularly prevalent in industries with large intangible assets, like pharmaceuticals and technology (De Simone et al. 2014). For example, a U.S.-based pharmaceutical company can transfer ownership of a drug patent from its U.S. headquarters to a low-tax foreign subsidiary, like Ireland. The Irish subsidiary would then charge royalties to the U.S. headquarters for use of the patent thereby moving the earnings from the U.S. to the Irish subsidiary. Because Ireland has a much lower corporate tax rate than the U.S., the firm significantly reduces its tax burden on the earnings for that drug.

The process of income shifting is highly opaque and firm outsiders have very little useful information on the volume or specifics of a multinational's transfer pricing activity (Dischinger and Riedel 2011; Karkinsky and Riedel 2012). As a result, income shifting creates an additional layer of opacity for firm outsiders. If firms do not regularly repatriate income earned abroad, and there is no established pattern of behavior, the task of forecasting future tax rates will be more difficult. As a result, analysts may have more difficulty forecasting for these types of firms.

In Exhibit 21 of the Form 10-K, firms are required to disclose the countries where their *significant* subsidiaries are located. However, firms are not required to disclose financial information for these subsidiaries. As a result, outsiders are able to identify the

countries in which the firm may operate, but most often firm outsiders cannot observe the income earned or cash held in those countries due to the lack of financial information for the individual foreign subsidiaries.

Country-level disclosure of operations is addressed in financial reporting requirement ASC 280. Firms are required to disclose sales and assets, but not profits, for each *material* country in which they operate. However, the definition of *materiality* is vague and is left, for the most part, to the discretion of management. For countries considered *immaterial*, financial information can be aggregated. As the guidelines in ASC 280 are limited, most multinational firms take advantage and do not disclose the activities of their foreign operations on a country-by-country basis. Instead, firms tend to provide an aggregate high-level disclosure of overall foreign operations or foreign operations by region. Because the information is provided in aggregate, firm outsiders do not have specific information on exactly where the company operates or financial information related to individual foreign subsidiaries. In fact, Gramlich and Whiteaker-Poe (2013) document that 98 percent of Google's subsidiaries and 99 percent of Oracle's subsidiaries disappeared from Exhibit 21 of their Form 10-Ks between 2009 and 2010, even though the authors later found the vast majority of these subsidiaries were still active. This finding illustrates firms' incentives to aggregate their disclosure of foreign operations.

As a result of the incentives created by the U.S. worldwide taxation system, many large firms will maintain large amounts of cash overseas (Krull 2004). These large cash holdings as well as current earnings are relatively invisible to firm outsiders due to the limited reporting requirements for foreign operations. Even disclosures of permanently

reinvested earnings and the estimate of deferred tax liability associated with those earnings, when disclosed, are not wholly relevant or useful for firm valuation (Bauman and Shaw 2008).

For firms that choose to disclose foreign earnings, disclosures most likely will not provide outsiders with a clear picture of how the foreign earnings will be used. U.S. multinationals operating in foreign countries have many options for the use of their overseas earnings. Firms can repatriate earnings for reinvestment in the U.S. but face U.S. residual taxes if they choose to repatriate earnings. Alternatively, firms can keep money overseas for investment, operations, other business strategies, or simply stash the cash. Research suggests that firms hold approximately 45 percent of their permanently reinvested earnings in financial assets, meaning that more than half of the foreign earnings of U.S. multinationals are not readily available for repatriation (Blouin et al. 2014). Hanlon et al. (2015) document that firm strategies as they relate to foreign cash also affect domestic operations and investment strategies. For example, having accumulated earnings outside the U.S., firms are more likely to engage in foreign (rather than domestic) acquisitions. Beyond these studies, the use of foreign cash has not been well explored in the literature and is not well understood. As foreign earnings and foreign cash holdings have important implications for firm ETR, this information is essential to analysts' accurate forecasting of ETR. Earnings can be generated in any number of foreign countries. If analysts do not know from which country the money will be repatriated or whether the earnings will be designated as permanently reinvested, the analyst will have difficulty in forecasting the ETR. Repatriation from a relatively higher

tax jurisdiction has a very different effect on firm ETR than repatriation from a low tax jurisdiction.

Given the limited understanding of firm activities with foreign profits, it is difficult for analysts and other firm outsiders to predict which activities a firm might undertake. Will the firm keep the money overseas or repatriate? If the pattern is not consistent year-to-year, analysts may have difficulty predicting year-to-year earnings and hence, year-to-year ETR.

To add to the complexity of these multinational firms and their tax situations, most multinationals operate in multiple foreign countries Each of these countries has its own individual tax rates and rules, creating individual incentives for repatriating or not repatriating income earned there. Overall, multinational firms consider a variety of factors when deciding what to do with their foreign cash holdings, whether they bring cash back to the U.S. or use the cash internationally. As ASC 280 does not require country -by-country disclosure, and as most firms aggregate their disclosures, parsing out the individual tax liabilities and incentives for every country in which a firm operates can be very difficult for an outsider like an analyst.

As firms are not required to disclose detailed reports of their overseas profits and cash holdings, investors, analysts, and governments do not have a clear picture of this part of the firm's finances and operating activities. Not only is it unclear how the foreign cash will be used by the firm, it is also unclear exactly how much foreign cash the firm may have. This setting creates an opaque information environment for outside stakeholders of U.S. firms operating overseas.

Analysts and Taxes

The literature on analysts' use of accounting information and earnings forecasting behavior is well developed. Prior literature demonstrates that analysts play an important role as information intermediaries and firm monitors in the capital markets. For example, analyst coverage has been shown to reduce corporate tax aggressiveness (Allen et al. 2016, McInerney 2010). The literature on analysts and their use of tax information for forecasting earnings is less developed but in general demonstrates that analysts fail to fully incorporate tax information leading to greater forecast errors for firms with more complex tax environments. Plumlee (2003) documents that analysts issuing tax forecasts impound less complex tax information to a greater extent than they do more complex information. Similarly, analysts have greater earnings forecast errors for firms with larger book-tax differences (Weber 2009), firms that are more tax aggressive (Balakrishnan et al. 2012), and firms that have greater volatility in their quarterly ETR (Bratten, Gleason, Larocque, Mills 2017). Further, Kim, Schmidt, and Wentland (2015) provide evidence that analysts incorporate tax information into their annual earnings forecasts differently than they incorporate other earnings information in that they underreact to the tax change component of earnings. Taken together, these studies suggest that analysts either do not have the ability to analyze tax information, or they choose not to because the costs of information processing exceed the benefits.

Post-tax earnings forecasts by analysts have been available for decades. More recently, analysts have begun disseminating other types of forecasts (e.g., pre-tax, sales, revenue, EBIT). Pre-tax forecasts have become more common resulting in implied forecasts of tax expense and estimated tax rates becoming available to the investing

public. Correspondingly, researchers have begun to investigate the forecasting activities of analysts and their tax forecasts. Bratten et al. (2017) investigate how analysts use and improve upon the mandatory ETR forecasts of firm managers.[4] They document that analysts understand complex tax environments and that as complexity increases, the accuracy of their forecasts, relative to managers' mandatory ETR forecasts, increases. This provides evidence that analysts are not naively following manager forecasts but are able to improve upon them, contrasting with evidence that analysts ignore or are not able to analyze complex tax environments when producing earnings forecasts. Further evidence of the usefulness of analyst tax forecasts is documented in Mauler (2015). He provides evidence that not only are analyst tax forecasts relatively accurate (compared to other forecast types), they are informative to the market, used by investors, and contribute to analysts' monitoring role by reducing tax aggressiveness.

Prior literature has inconsistent findings as it relates to analysts and their use of tax information for forecasting. Some demonstrate that analysts are unable or unwilling to use complex tax information and others demonstrate that analysts do use this information and improve upon other information sources available to the market. Thus, it is not inherently clear how analysts will handle the information contained in firms' foreign operations disclosures when issuing pre-tax and post-tax forecasts. Moreover, the setting may not be as complex as it seems as most multinational firms are very large and tend to have consistent profits year-to-year. Especially if the firm engages in a consistent repatriation and income shifting scheme, over time their tax rate may be relatively

[4] Under ASC 740-270, managers are required to disclose annualized ETR forecasts each quarter using the integral method.

persistent year-to-year, making an analyst's forecasting task less difficult. In addition, these large firms tend to have a better information environment on the whole, which may off-set some of the disclosure opacity as it relates to foreign operations. Given some contradictory evidence in prior literature and considerations of multinational firms' information environment, the effect of foreign operations on analyst forecasting accuracy remains an open empirical question.

Literature has also shown that analysts have the ability to obtain proprietary information (even under Regulation Fair Disclosure) from a variety of sources. One important source is management earnings conference calls. Mayew (2008) demonstrates that analysts can generate new and valuable private information by asking questions on earnings conference calls. Analysts' personal and professional networks may also make it possible for them to generate useful private information to aid in their forecasting task (Cohen et al. 2010).

I examine whether the tax activities of multinational firms make forecasting the ETR for those firms inherently more difficult than forecasting for domestic firms. Foreign operations create an opaque information environment, making it more resource intensive and challenging for analysts to collect and analyze the needed information to issue forecasts. If this tax information is needed for analysts to produce accurate ETR forecasts, and the information is more difficult for analysts to interpret or obtain, then I expect analysts' forecasts of the ETR for those firms will be less accurate. Given the ambiguous and subjective reporting requirements for foreign operations, and the large effect foreign earnings could have on future firm ETR, I believe analysts will have more

difficulty forecasting for multinational firms than purely domestic firms. Therefore, my first hypothesis is:

> **H1:** Analyst ETR forecasts for multinational firms are less accurate than ETR forecasts for domestic firms.

An additional layer of complexity is added for firms utilizing foreign tax havens. Tax haven countries are considered those that offer a tax rate much lower than the U.S. federal rate. Countries are more likely to become a tax haven if they are small, affluent, and well-governed (Dharmapala and Hines 2009). Each year, U.S. multinationals are able to avoid paying large amounts of U.S. federal income taxes through the use of tax havens. The Institute on Taxation and Economic Policy estimates that at least 366 of the Fortune 500 companies utilize tax havens. Firms that have more international operations in general, greater intrafirm trade, and higher research and development intensity, are the most likely to utilize tax havens (Desai, Foley, Hines 2006). Firms are able to facilitate tax avoidance through the use of tax havens by first reducing the foreign tax liability on foreign income, and second, by reallocating income away from high-tax jurisdictions.

Dyreng and Lindsey (2009) document that firms operating in at least one tax haven country have a 1.5 percentage point lower global tax burden than those with no tax haven operations. Thus, if a company maintains its profits overseas in the haven, it must only pay taxes at the low haven rate, and not pay any taxes on those profits to the U.S. government (until the profits are repatriated), resulting in a reduced global tax burden. Haven use increases firm complexity (Bennedsen and Zeume 2015) and further increases the opacity of the information environment surrounding the firm as additional cash is held overseas and firms become less transparent about their overseas activities.

Moreover, Akamah, Hope, and Thomas (2018) document that multinational firms with foreign operations in tax haven countries tend to aggregate their foreign operations disclosures under ASC 280 to a greater extent than those multinationals not operating in tax havens. This suggests even greater information opacity for these haven firms relative to their multinational peers not operating in tax havens.

To take a closer look at the ability of analyst to produce ETR forecasts for firms with foreign operations, I examine the effect of firms with foreign operations in haven (and non-haven) countries. If the tax activities of these haven firms add an additional layer of complexity and opacity that make the forecasting task even more difficult, I expect the forecast error of analysts' ETR forecasts to be greater for firms operating in tax havens than domestic firms or multinationals not utilizing tax havens. However, if firms' reporting decisions and foreign earnings strategies do not differ greatly among multinationals, the ETR forecast errors may not significantly differ. If multinational firms behave similarly, regardless of whether their foreign subsidiaries are in havens, the forecasting task difficulty may not differ between these two firm types.

Challenges to Forecasting

There are many reasons why analysts may have more difficulty forecasting for multinational firms. I explore three potential reasons: persistence of ETR, management forecasting, and losses. I argue above that factors like increased complexity, decreased disclosure, and information environment opacity likely lead to greater analyst forecast errors for multinational firms. Below, I examine how these factors impact analysts' ETR forecasts. As noted in prior literature (Dyreng et al. 2017), the presence of foreign operations has a measurable effect on the firm's ETR. If the firm's repatriation and

overall tax strategy differs from year-to-year, the firm's ETR is unlikely to remain constant over time. This lack of persistence in ETR may be one factor leading to the difficulty in forecasting ETR for multinationals.

Analysts tend to underestimate the persistence of ETR changes year-to-year, leading to increases in forecast errors for their earnings forecasts (Kim et al. 2015). These changes in ETR are relevant, and Schmidt (2006) documents that the tax change component of earnings persists and is relevant for forecasts of future earnings. Hanlon (2003) documents that taxes are relevant to the persistence of earnings. Earnings are less persistent in firm-years with large book-tax differences than firm-years with small book-tax differences

Multinational firms may be better able to maintain a persistent ETR as foreign earnings are one method of managing earnings (Krull 2004) and could be used similarly to smooth ETR year-to-year. Management could choose to shift income and repatriate more or less year-to-year in order to manage ETR to maintain a more consistent rate. If this is the case, analysts may not have more difficulty forecasting the ETR for these firms and forecast error may not increase due to foreign operations.

However, prior evidence demonstrates that firms are inconsistent in their repatriation strategies and ETRs are changing over time. Thus, I believe that the persistence of ETR for these multinational firms will be lower than domestic firms and investigate whether foreign subsidiaries inside or outside of havens, affects the persistence of ETR. This leads to my second hypothesis:

> **H2A:** The year-to-year persistence of firm ETR is lower for firms with foreign operations, both inside and outside of tax havens.

An additional factor that may make the analysts' forecasting task more difficult is the availability and quality of disclosures from management. Managers of multinational firms may have more discretion in operating and investment decisions and more ability to exploit the international environment to the firm's advantage. This could in turn create additional information asymmetry between analysts and management, and analysts may have more difficulty predicting managers' behavior (Duru and Reeb 2002). Managers can choose to issue earnings guidance and have a variety of incentives to either disclose or not (Healy and Palepu 2001). If managers of multinational firms are opting not to provide earnings forecasts, or if their earnings forecasts are less accurate than those of domestic firms, the information environment surrounding the firm will be reduced, and this could lead to increased forecasting difficulty for the analysts. Thus, as analysts have more difficulty forecasting for multinational firms, it may be because the managers of these firms are not as likely to issue voluntary earnings forecasts. This leads to the second part of my second hypothesis:

> **H2B:** Managers of multinational firms are less likely than managers of domestic firms to issue earnings forecasts.

A third factor that may negatively impact analyst forecast accuracy for multinational firms is the presence of a loss. Prior literature has shown that analyst forecasts are less accurate for loss firms (Das 1996). A multinational firm has the potential for a loss domestically, a loss overseas, or a loss both places. This complexity may contribute to the increased forecast error for analysts issuing forecasts of multinational firms. If analysts already have more difficulty forecasting for loss firms, the added complexity of a multinational firm could further exacerbate the presence of a loss.

I expect analyst forecast error to be greater for multinational firms with a loss, as stated in the third part of my second hypothesis:

> **H2C:** Analyst implicit ETR forecast error will be greater for multinational firms with a loss.

Taken together, these three factors may contribute to the result that analysts' implicit ETR forecast errors are greater for multinational firms than domestic firms. Given I have established a difference in forecast accuracy, and explore some reasons therefore, it follows to test potential implications of this finding.

Implications

To examine the implications of my results, I begin with a cumulative abnormal returns test to assess the market's response to analyst earnings forecast accuracy. I then split each earnings forecast into a tax component and a non-tax component to see if the market responds differently to the forecast error related to each. Mauler (2015) documents that the market does respond to the information in analysts' tax-related forecasts. Thus, I expect the market to react to both the tax and non-tax components of the analyst's forecast and further investigate if this response differs for multinational firms or firms operating in tax havens. Thomas and Zhang (2011) posit that a positive surprise to tax expense provides an incremental positive signal of future firm profitability. Further, Baik et al. (2016) document that the tax expense surprise is positively associated with future returns. Thus, I expect the market to respond positively to positive surprise in both the tax and non-tax components of the earnings forecast. My third hypothesis explores whether or not investors view analysts' tax forecasts as value-relevant information:

H3: The market responds positively to the tax and non-tax components of analysts' earnings forecasts.

It is not altogether obvious if the market will respond to the tax component of the forecast. If the majority of the information is contained in the non-tax component, a market effect may not be present for the tax portion. Additionally, the market may not respond positively to a firm beating a tax forecast, as this means the firm will be paying additional taxes than what was forecasted. To some this may seem like a negative signal, as it implies a greater cash outflow to the taxing authority, leaving less cash available for shareholders. However, given evidence in prior literature that there exists a positive relation between stock returns and tax expenses, I expect the market to react positively to a positive surprise in the tax component of the earnings forecast. A positive earnings surprise overall, as well as a positive tax and non-tax surprise, should provide positive signals to the market and result in a positive reaction.

CHAPTER 3

DATA AND RESEARCH DESIGN

Main Tests

My main sample combines I/B/E/S, Compustat, and a hand-collected haven data set provided by Scott Dyreng, for United States publicly-traded firms. The sample begins in 2003 as pre-tax forecasts are not available in I/B/E/S before 2003. The sample ends in 2016. The haven sample ends in 2014 as that is the last year collected in the haven data set. I first obtain all annual pre-tax and post-tax analyst forecasts from I/B/E/S. I include an analyst's first forecast issued within 90 days following the prior year's earnings announcement date. I exclude forecasts for firms with an analyst following of fewer than three. I then form the median firm-year consensus, resulting in a sample of 62,934 firm-years. After excluding observations with missing data, I obtain a final sample of 12,534 firm-years. Further excluding observations with missing haven data, I obtain a final haven sample of 10,502 firm-years. Data for firm fundamentals and control variables are taken from Compustat. Details on sample selection can be found in Table 1.

Many analysts include explicit forecasts of firm ETR (or tax expense) in their reports. However, I/B/E/S does not capture these detailed tax forecasts. Thus, I obtain data on analysts' annual one year ahead *explicit* pre-tax (PRE) and *explicit* post-tax (NET) earnings forecasts from I/B/E/S to construct a sample of *implicit* ETR forecasts as in prior literature (Bratten et al. 2017; Mauler 2015). For each analyst who issues both a pre-tax and post-tax forecast for firm *i* in year *t*, I include only the analyst's first pre-tax and post-tax forecast for the firm issued within 90 days following the prior year's earnings announcement. The pre-tax and post-tax forecast must be issued on the same

day to ensure comparability of the forecasts. The implicit forecasted ETR is constructed as:

$$Implicit\_ETR_{it} = \frac{PRE_{it} - NET_{it}}{PRE_{it}} \quad (1)$$

I then manually form the consensus implicit ETR forecast for the firm-year by taking the median of all individual analysts' implicit ETR forecasts for that firm-year period. The sample is restricted to only firms with an analyst following of three or more in order to construct a valid consensus.

The actual ETR is calculated as in (1) above using the explicit pre-tax and post-tax earnings as reported by I/B/E/S. Next, I compute the consensus implicit ETR forecast error as the absolute value of the difference between the calculated *actual* ETR and the implicit consensus analyst ETR *forecast* for the firm-year. I use implicit ETR forecast error as the dependent variable in my analyses testing Hypothesis 1.

My primary analyses focus on multinational versus domestic firms. I include one variable of interest, *MNC*. Data on foreign operations are taken from the Compustat Historical Segments Annual File. If a firm reports one or more foreign segments, it is considered to have foreign operations in that year and *MNC* takes the value of 1.[5] I explore the effect of foreign operations on analyst implicit ETR forecast error using the following multivariate model:

$$ETR\_FE_{i,t+1} = \alpha_0 + \boldsymbol{\alpha_1 MNC_{i,t}} + \alpha_2 Size_{i,t} + \alpha_3 MtoB_{i,t} + \alpha_4 NAnalyst_{i,t} + \alpha_5 Accruals_{i,t} + \alpha_6 LagETR\_FE_{i,t} + \Sigma_{Year} + \varepsilon_{i,t+1} \quad (2)$$

[5] I conduct a number of sensitivity tests to ensure my definition of the *MNC* variable is not driving my results. First, I define MNC based on the percent of foreign pre-tax income (PIFO) relative to total pre-tax income. Results are qualitatively similar. Next, I define MNC based on the persistence of PIFO and again find qualitatively similar results.

The dependent variable is the implicit absolute ETR forecast error in year *t+1*. If foreign operations make the forecasting task more difficult, I expect the coefficient for *MNC* to be positive, indicating an increase in forecast error. In a sensitivity test I also test the dispersion of implicit ETR as the dependent variable but find no significant effect of *MNC* on dispersion.

The control variables included are those prior literature has demonstrated have an effect on the information environment of a firm (Bratten et al. 2017; Weber 2009). Firm size (*Size*) and analyst following (*NAnalyst*) have been shown by prior research to positively affect the information environment of a firm and increase forecast accuracy (Lang and Lundholm 1996). *Size* is measured as the natural log of total assets. Analyst following is the number of analysts following the firm in year *t*. I expect the coefficients on these two controls to be negative, indicating a decrease in forecast error. I include the control for market to book ratio (*MtoB*) as firms with larger market to book ratios are considered less complex and are expected to be less difficult to forecast for (Bratten et al. 2017). I control for accruals as it has been shown that analysts are inefficient with respect to the information in accruals leading to increased forecast errors (Bradshaw et al. 2001). I use balance sheet information to measure accruals as in Weber (2009). I expect the coefficients on both *MtoB* and *Accruals* to be negative. Lastly, I control for prior year's forecast error as prior research demonstrates a positive serial correlation in analysts' forecast errors (Abarbanell and Bernard 1992). I include year fixed effects to control for time varying differences in the forecasting task difficulty. Industry data are taken from I/B/E/S. Industry is coded as a six-digit Sector/Industry/Group (SIG) number. I define industry as the first four digits of the SIG code. All standard errors are robust and

clustered by firm. Continuous variables are winsorized at 1% and 99%. Additional details on variable descriptions are presented in Appendix A.

My next analysis looks more specifically at multinational firms by splitting them based on whether they operate in a haven country or not. I include two main variables of interest: *MNC_Non* and *MNC_Haven*. Data on the location and use of tax havens are taken from Scott Dyreng's website.[6] Data include countries in which a firm discloses, via Exhibit 21 of form 10-K, significant subsidiaries as required by the SEC. The data are complete through 2014. A firm is considered to be operating in a haven if it reports significant operations in Exhibit 21 in a country identified as a tax haven in year *t*, and otherwise is considered as a non-haven firm. In alternate specifications, I use the number of tax havens and find qualitatively similar results. To form my variables of interest, I combine the data on foreign operations with the haven data. *MNC_Non* takes a value of 1 for firms with foreign operations that are not operating in a foreign country designated as a tax haven, and 0 otherwise. *MNC_Haven* takes a value of 1 for firms with foreign operations in at least one country designated as a tax haven, and 0 otherwise. Thus, firms with only domestic operations are captured in the intercept term of the model. If foreign operations in non-haven countries make the forecasting task more difficult, I expect the coefficient for *MNC_Non* to be positive, indicating an increase in forecast error. Similarly, if operations in foreign tax havens make the forecasting task more difficult, I

[6] Exhibit 21 data are available from Scott Dyreng's website (https://sites.google.com/site/scottdyreng/Home/data-and-code). "Exhibit 21 in the Form 10-K provides a list of the firm's material subsidiaries, as required by the SEC. The Exhibit 21 materiality benchmark is 10% of total assets, pre-tax income, or investment per individual subsidiary as well as per an aggregate of all non-individually disclosed subsidiaries. Hence, all individually disclosed subsidiaries must constitute more than 90% of total assets, income, or investment (Item 601 of SEC Regulation S-K)." (taken from Akamah, Hope, Thomas WP 2017)

expect the coefficient for *MNC_Haven* to also be positive. I perform an F-test on the coefficients for *MNC_Non* and *MNC_Haven* to determine if the effects are significantly different between the two types of foreign operations. The control variables are the same as in Model 2.

Next, to examine what might be driving the effect of *MNC* (and *MNC_Non* and *MNC_Haven*) on forecast error, I explore three factors: ETR persistence, management disclosure, and loss. I first examine how the persistence of implicit ETRs varies across differences in foreign operations using the following model:

$$ETR_{i,t+1} = \alpha_0 + \alpha_1 ETR_{i,t} + \alpha_2 MNC_{i,t} + \boldsymbol{\alpha_3 ETR_{i,t} * MNC_{i,t}} + \Sigma_{Year} + \varepsilon_{i,t+1} \quad (3)$$

The dependent variable is calculated *actual* ETR as reported by I/B/E/S in year *t+1* and the independent variable is the calculated *actual* ETR in year *t* as a main effect and then interacted with *MNC* in Model 3. As a further sensitivity analysis, I replace *MNC* with *MNC_Non* and *MNC_Haven* to test the effect of havens. I expect the coefficient on the interaction term of *ETR*MNC* to be negative if foreign operations are associated with decreased ETR persistence.

To assess whether the presence or quality of management guidance may affect the forecast error of analyst ETR forecasts for multinational firms, I conduct analyses of management voluntary disclosure in two ways. Management disclosure data are taken from I/B/E/S Guide. I construct a sample of annual EPS disclosures of U.S. firms. After merging with control variables from Compustat and data on foreign operations, I obtain a sample of 29,627 firm-years. I first conduct a test of the likelihood of earnings disclosure through the use of a logistic regression of model (4):

$$M\_Guide_{i,t} = \alpha_0 + \boldsymbol{\alpha_1 MNC_{i,t}} + \alpha_2 Size_{i,t} + \alpha_3 MtoB_{i,t} + \alpha_4 NAnalyst_{i,t} + \alpha_5 Loss_{i,t} + \Sigma_{Year} + \varepsilon_{it} \quad (4)$$

Here, *M_Guide* takes a value of 1 if management issues one or more voluntary earnings disclosures in year *t* and 0 otherwise. The independent variables are as defined in previous models. In a sensitivity test I replace *MNC* with *MNC_Non* and *MNC_Haven* to test the effect of havens. If management of multinational firms is less likely to issue voluntary disclosure, I expect the coefficient on *MNC* to be significantly negative. In the second test, I examine the effect of *MNC* on management forecast error of annual EPS forecasts. I use Model (2) but replace the dependent variable with the management annual EPS forecast error calculated as the difference between the actual EPS and the forecasted EPS as reported by I/B/E/S.

The third test explores whether having a loss makes forecasting for a firm more difficult. I first test this on the entire sample of both multinational and domestic firms. I use Model (2) but also include the loss variable and an interaction between *Loss* and *MNC*. If a loss makes the forecasting task more difficult, I expect the coefficient on *Loss* to be positive. Similarly, if a loss makes the forecasting task for a multinational firm incrementally more difficult, I expect the coefficient on *MNC*Loss* to be positive. Then, I take the sample of multinational firms and test three different types of loss occurrence: domestic loss (PIDOM < 0, PIFOR > 0), foreign loss (PIDOM > 0, PIFOR < 0), and a loss both domestic and foreign (PIDOM < 0, PIFOR < 0). I conduct F-tests of the coefficients to confirm if there are significant differences in effects across loss type. Again, I used Model (2) but with the addition of the three loss variables and expect the

coefficients on each of these variables to be positive, indicating an increase in forecast error.

Cumulative Abnormal Returns Tests

To test my third hypothesis and explore investors' response to the pre-tax and post-tax components of analysts' forecasts, I conduct a cumulative abnormal returns (CAR) test. I construct this sample by utilizing the last forecast (prior to the earnings announcement in year *t*) issued by an analyst in each firm-year. As before, I eliminate firms with fewer than three analysts following and construct the median consensus. I obtain returns data from CRSP. After eliminating observations with missing data, I have a sample of 10,763 firm-years. This sample is further reduced to 8,696 firm-years when eliminating observations that do not have haven data. I first establish a baseline market response by testing the following model:

$$CAR_{i,t} = \alpha_0 + \boldsymbol{\alpha_1 EPS\_FE_{i,t}} + \alpha_2 Size_{i,t} + \alpha_3 MtoB_{i,t} + \alpha_4 Momentum_{i,t} + \Sigma_{Year} + \epsilon_{i,t} \quad (5)$$

In Model 5, the variable of interest is *EPS_FE*, the analyst earnings per share (EPS) forecast error. The dependent variable is the standardized market-adjusted 3-day CAR centered on the earnings announcement date for year *t.* In untabulated analyses, I test non-standardized CAR and raw CAR, as well as 5-day and 7-day CAR, and find qualitatively similar results. EPS forecast error is defined as:

$$EPS\_FE = \frac{Net_{actual} - Net_{forecast}}{Shares\ Outstanding} \quad (6)$$

Next, I separate the EPS forecast error into two components: tax forecast error and non-tax forecast error. I then test the following model:

$$CAR_{i,t} = \alpha_0 + \boldsymbol{\alpha_1 Tax\_FE_{i,t}} + \boldsymbol{\alpha_2 NonTax\_FE_{i,t}} + \alpha_3 Size_{i,t} + \alpha_4 MtoB_{i,t} +$$

$$\alpha_5 Momentum_{i,t} + \Sigma_{Year} + \epsilon_{i,t} \quad (7)$$

In Model 7, the variables of interest are the Tax forecast error and Non-Tax forecast error components of total EPS forecast error. Here, tax forecast error is defined as:

$$Tax\_FE = \frac{ETR_{FE} * PreTax_{forecast}}{Shares\ Outstanding} \quad (8)$$

I define the non-tax forecast error as the difference between EPS forecast error and tax forecast error (Model 6 – Model 8). If investors respond to the forecast error, I expect a significant and positive sign for the coefficient of *EPS_FE, Tax_FE*, and *PreTax_FE*, indicating the market is responding to the analysts' forecast errors. In Model 7, I conduct an F-test of the difference between the coefficients of *Tax_FE* and *NonTax_FE*. Lastly, I conduct CAR analyses including, first, interactions with *MNC* and, second, interactions with *MNC_Non* and *MNC_Haven* to explore the effect of foreign operations on the market response.

CHAPTER 4

RESULTS

Table 2 reports the descriptive statistics for the sample of 12,534 firm-years with no missing data for variables of interest or control variables. Approximately 71% of firms have foreign operations. The average analyst following is 13 analysts with a maximum of 32. Correlations between variables are presented in Table 3. The Pearson correlations are in the top right, and Spearman in the bottom left. Control variables are negatively correlated with implicit ETR forecast error, as expected from prior literature.

I first examine the effect of foreign operations, in general, on analysts' forecasting accuracy. These results are presented in Table 4. Column 1 presents the results on the full sample of multinational firms and Column 2 on the smaller haven sample. The model includes other factors known to be associated with analyst forecast error as controls. As discussed previously, ETR forecast error is calculated as the absolute difference between the calculated ETR actual and implicit ETR forecast for year $t+1$. The results demonstrate that increased analyst implicit ETR forecast error is associated with firms with foreign operations (coefficient on *MNC* is 0.0235). The estimated coefficients for the control variables are as expected and consistent with prior literature, with the exception of *Accruals*. Larger firms, firms with a larger analyst following, larger market to book ratio, and larger accruals, have lower forecast error, indicating that forecasting for firms of these types is easier. As in prior literature, the estimated coefficient for *LagFE* is significantly positive, demonstrating positive serial correlation in analyst ETR forecast error.

I also investigate if the effect of foreign operations differs for firms operating inside or outside of tax haven countries as reported in Table 4 Column 3. I find that both haven firms and non-haven firms are more difficult to forecast for than domestic firms, as evidenced by the significantly positive estimated coefficients on both *MNC_Haven* (0.0404) and *MNC_Non* (0.0480). An F-test of the difference between the coefficients yields a p-value of 0.6050 suggesting there is no significant difference between the effect of haven and non-haven multinational firms. This result is somewhat unexpected, as foreign operations in a haven country add additional complexities to the firm which would suggest the firm would be more difficult to forecast for than a firm with no operations in a tax haven country. However, it seems that analysts may have difficulty obtaining and/or processing the information for firms with both types of foreign operations. The key difference is between multinational and domestic firms rather than between haven and non-haven firms.

The results in Table 4 demonstrate that analysts have more difficulty forecasting ETR for firms with foreign operations, whether the foreign operations are in a haven or not. To explore why this might be true, I conduct a test of three potential factors: persistence of ETR, manager forecasts, and losses.

I first test the persistence of the ETR as it relates to foreign operations and haven. These results are presented in Table 5. As expected, prior year ETR is positively related to current year ETR as presented in Column 1. The coefficient on the interaction term of *ETR*MNC* (-0.1922) is significantly negative, indicating that foreign operations is associated with a significant incremental decrease in the persistence of ETR as compared to domestic firms. This supports the prediction in Hypothesis 2A. Column 2 presents that

the results also hold when separating the multinational firms into those operating inside and outside of havens. When looking at the interaction terms, it can be seen that foreign operations in both haven and non-haven countries negatively incrementally impact the persistence of ETR. The coefficients for both *ETR*MNC_Haven* (-0.1895) and *ETR*MNC_Non* (-0.1473) are significantly negative. This suggests that firms with foreign operations, in both haven and non-haven countries, have less persistent ETRs, supporting Hypothesis 2A. This decrease in persistence may make the year-to-year changes in ETR more difficult to predict, leading to the increased forecast errors as documented in Table 4. This is one possible explanation for why analysts have more difficulty forecasting for multinational firms.

Next, I test the likelihood and accuracy of management voluntary earnings forecasts. If managers of multinational firms are issuing forecasts less frequently or if those forecasts are less accurate, the information environment surrounding those firms would be of lower quality and could lead to greater difficulty in the forecasting task for analysts. In contrast, if managers of multinationals are issuing high quality earnings forecasts, this is most probably not a factor that explains the results in Table 4.

Panel A of Table 6 presents the results of the logistic regression testing the likelihood of management issuing an annual voluntary earnings forecast. Managers of multinational firms are *more* likely to issue voluntary earnings forecasts than managers of domestic firms (coefficient of *MNC* is 0.5861). This does not support the expectation of hypothesis 2B. Panel B of Table 6 presents the results of the accuracy test. The dependent variable is the absolute manager forecast error. As can be seen in Column 1, there is no significant difference between the accuracy of forecasts for managers of multinational

firms and managers of domestic firms. Similarly, Column 2 presents that there is no significant difference between managers of multinational firms inside or outside of havens and managers of domestic firms. Managers of multinational firms are issuing earnings forecasts and those earnings forecasts do not significantly differ in accuracy from domestic firms, in contrast to the expectation in Hypothesis 2B. Thus, it appears that a lack of quality management guidance may not be a factor in why analysts have greater difficulty forecasting for multinational firms.

Lastly, I examine the effect of losses. Prior literature has demonstrated that loss firms are more difficult to forecast for. The results in Panel A of Table 7 support these findings and Hypothesis 2C. I also find that analyst forecast error for multinational firms with a loss are incrementally less accurate (coefficient of *MNC*Loss* is 0.0961). Panel B of Table 7 presents the results of the test of the sample of multinational firms only. Analyst forecasts of multinationals with any type of loss are less accurate. When looking at the F-tests of the coefficients, I find that the effect on implicit ETR forecast error of domestic losses is greater than the effect of foreign losses. Taken together, this demonstrates that analysts have difficulty forecasting for loss firms, incrementally more difficulty forecasting for multinational loss firms, and for those multinational loss firms, have more difficulty if the loss is a domestic loss.

In an untabulated analysis, I conduct a test to determine if persistence or loss may be the driving factor to explain the results in Table 4. I first determine which firms are considered low ETR persistence firms by conducting a test of the average ETR persistence by firm, ranking the firms, then splitting the firms at the median persistence coefficient. Firms below the median are considered low persistence firms. I then re-run

the analysis in Table 7 for the low persistence and non-low persistence samples. The result for *MNC*Loss* for the low persistence sample is consistent with the result in Table 7. However, for the non-low persistence sample, the result is not significant. Losses do not appear to have a significant incremental effect for multinational firms when ETR persistence is high, but the effect is incrementally significant when ETR persistence is low. This suggests persistence drives the result for *MNC* as shown in Table 4, and not losses.

To test Hypothesis 3, I conduct a CAR analysis. The results are presented in Table 8. As can be seen in Column 1, the market responds positively to the analysts' error in forecasting earnings. The positive and significant coefficient for *EPS_FE* (0.1134), suggests that the market has a strong positive reaction to a firm beating the analysts' earnings forecast (a positive earnings surprise) where the actual earnings reported is greater than the analysts' forecast. After separating earnings forecasts into the tax and non-tax components, it is evident that the market responds to both types of forecast error, as presented in Column 2. The market clearly uses the information in the disaggregated forecasts, using both the non-tax component and the tax component of analysts' forecasts to measure firm performance. The market has a strong positive reaction to the firm beating the analysts' predictions as evidenced by the significantly positive coefficients on *Tax_FE* (0.1265) and *NonTax_FE* (0.1140). Columns 3 and 4 show that there is no incremental difference in market response for multinational firms overall, nor for multinational firms inside tax haven countries. Regardless of the type of firm, the market reacts positively to the overall earnings forecast error as well as the tax and non-tax components of the earnings forecast error. These results provide support for Hypothesis 3

and demonstrate that the market does find tax and non-tax forecasts useful. Thus, analyst implicit ETR forecasts are useful and informative to the market when valuing firm performance.

Overall, my results demonstrate that analysts have greater difficulty forecasting for multinational firms, regardless of whether the foreign operations are inside or outside of tax haven countries. One reason this may be true is that the persistence of a firm's ETR is decreased for those firms with foreign operations (both inside and outside tax havens). In addition, losses may contribute to the analyst forecast error as multinational firms with a loss either domestically or abroad (or both) are incrementally more difficult to forecast for. As managers of multinational firms are more likely to provide earnings forecasts and those forecasts are no less accurate than management forecasts of domestic firms, it does not appear that a lack of disclosure by management affects analyst ETR forecasts for multinationals. Lastly, I show that the market responds to both the tax and non-tax components of earnings forecasts and that there is no incremental difference in this response for multinational versus domestic firms, showing that the market finds the information in both types of forecasts useful and important to firm valuation. These results illustrate the difficulty even sophisticated financial statement users have in predicting the activities of multinational firms and the tax implications therein.

CHAPTER 5

CONCLUSION

U.S. based multinational corporations are able to avoid paying billions of dollars in taxes to the U.S. government through the use of subsidiaries in low-tax foreign jurisdictions and foreign tax havens. Much attention has been paid to firms shifting profits from the U.S. to low-tax jurisdictions. My study contributes to the literature by demonstrating that even sophisticated financial statement users, financial analysts, are unable to accurately process the information contained in foreign operations disclosures to predict the future tax implications of foreign operations.

More specifically, I demonstrate that analyst implicit ETR forecasts are less accurate for firms with foreign operations than those firms operating domestically. Further, I demonstrate that this result holds in both haven and non-haven foreign jurisdictions and that there is no significant difference between these two settings. One reason analysts may have more difficulty predicting ETR for multinational firms is that the ETR is less persistent than domestic firms. The instability of firm strategy as it relates to foreign earnings seems to lead to an instability in ETR, making it difficult for analysts to predict the tax implications of future foreign earnings. Additionally, the presence of a loss may contribute to the increased forecast errors for analyst forecasts of multinational firms. Further, I show that a lack of accurate management earnings guidance does not contribute to the analysts' difficulty in forecasting for multinationals. I also demonstrate a market reaction to the tax and non-tax components of analysts' earnings forecasts illustrating the importance of these forecasts to the capital marketplace.

Overall, I demonstrate a consequence of the opacity of firm disclosures of foreign operations and foreign earnings. Current disclosure requirements make it possible for firms to better conceal their tax avoiding behavior and even sophisticated financial statement users appear unable to uncover and understand these firms' international tax strategies.

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APPENDIX A

VARIABLE DEFINITIONS

Dependent Variables	
ETR_FE	Analysts' implicit ETR forecast error. The difference between the implicit actual ETR for a firm-year and the median consensus forecast of implicit ETR for a firm-year, taken in absolute value.
ETR	Current year actual calculated ETR. Pre-tax earnings (PRE) minus post-tax earnings (NET) divided by pre-tax earnings (PRE), taken from I/B/E/S.
M_GUIDE	Takes the value of 1 if management issues one or more EPS forecasts in year *t*, and 0 otherwise.
M_EPS_FE	Management EPS forecast error. The absolute difference between actual EPS for the firm-year and the forecasted EPS for that firm-year.
CAR	The standardized market-adjusted 3-day cumulative abnormal returns centered on the earnings announcement date.

Variables of Interest	
MNC	Takes the value of 1 if a firm reports one or more foreign subsidiaries in the Compustat Historical Segments File, and 0 otherwise.
MNC_Haven	For firms with foreign operations, takes the value of one if the firm reports a significant subsidiary in one or more countries designated as a tax haven, and 0 otherwise.
MNC_Non	For firms with foreign operations, takes the value of one if the firm reports significant subsidiaries in countries that are not designated as a tax haven, and 0 otherwise.

Control Variables	
Size	The size of the firm as measured by the log of total assets (AT) as reported in Compustat.
MtoB	The ratio of market value to book value, taken from Compustat. The number of common shares outstanding times the price at the close of the fiscal year, divided by total common/ordinary equity. (CSHO*PRCC_F)/CEQ
NAnalyst	The number of unique analysts following a firm in year *t*.

Accruals	Firm accruals for year *t*, scaled by average total assets. Following Weber (2009) accruals are measured as: (ΔCurrent Assets - ΔCash) - (ΔCurrent Liabilities - ΔDebt included in current liabilities) - ΔDeferred Tax Liability - Depreciation [(ΔACT-ΔCHE) - (ΔLCT-ΔDLC) - ΔTXDITC - DP]
Loss	Takes the value of 1 if a firm reports a loss, as defined by negative net income, in year *t,* and 0 otherwise.
DomesticLoss	Takes the value of 1 for a multinational firm reporting pre-tax domestic income less than 0 and pre-tax foreign income greater than 0, and 0 otherwise.
ForeignLoss	Takes the value of 1 for a multinational firm reporting pre-tax domestic income greater than 0 and pre-tax foreign income less than 0, and 0 otherwise.
BothLoss	Takes the value of 1 for a multinational firm reporting pre-tax domestic income less than 0 and pre-tax foreign income less than 0, and 0 otherwise.
Momentum	Market momentum as taken from the Fama-French Daily Liquidity Factors database.
Industry	The first four digits of the six digit Sector/Industry/Group reported in I/B/E/S.

Table 1: Sample Selection

	Firm-Years
Median Consensus of the first forecast within 90 days of the earnings announcement for firms with 3 or more analysts following	62,934
Less firm-years missing prior year's data for lags	-38,478
Less firm-years missing Compustat data	-11,922
Final MNC Sample	**12,534**
Less firm-years missing Haven data	-2,034
Final Haven Sample	**10,502**

This table presents the sample selection process for the sample of 12,534 firm-years used for the tests of *MNC* and the 10,502 firm-years used for the tests of the effect of tax havens.

Table 2: Descriptive Statistics

Panel A: Full Sample Descriptive Statistics

	Mean	Median	Std. Dev.	Minimum	Maximum
ETR_FE	0.1262	0.0220	0.4517	0	4.4751
ETR	0.2924	0.3253	0.1375	0	0.9992
MNC	0.7100	1	0.4538	0	1
MNC_Non	0.1882	0	0.3909	0	1
MNC_Haven	0.5356	1	0.4988	0	1
MtoB	3.4937	2.5700	4.6421	-15.560	30.661
Size	7.5004	7.4085	1.7055	2.5374	12.637
NAnalyst	12.540	11	7.2392	3	32
Accruals	-0.0380	-0.0367	0.0558	-0.0276	0.1928

This table present descriptive statistics for the sample of 12,534 firm-year observations. Variable definitions are presented in Appendix A.

Panel B: Descriptive Statistics by Firm Type

	MNC	**Domestic**	
	Mean	Mean	Difference
ETR_FE	0.1286	0.1205	
ETR	0.2907	0.2967	**
MtoB	3.4803	3.5265	
Size	7.7181	6.9673	***
NAnalyst	13.055	9	***
Accruals	-0.0358	-0.0431	***

This table presents the mean statistics for the sample of 8,899 MNC firm-year observations and 3,636 domestic firm-year observations and the statistical difference between the means. Variable definitions are presented in Appendix A. ***, **, and *, indicate significance (two-tailed) at the 1%, 5% and 10% levels, respectively.

Table 3: Correlations

	ETR_FE	ETR	MNC	MtoB	Size	NAnalyst	Accruals
ETR_FE	1	-0.0454 ***	0.0081	-0.0405 ***	-0.0719 ***	-0.0549 ***	-0.0194 **
ETR	-0.1110 ***	1	-0.0199 **	-0.0667 ***	0.1814 ***	0.0074	-0.0722 ***
MNC	0.0708 ***	-0.1217 ***	1	-0.0045	0.1998 ***	0.1113 ***	0.0626 ***
MtoB	-0.2279 ***	-0.0883 ***	0.0318 ***	1	-0.0409 ***	0.0910 ***	0.0060
Size	-0.0731 ***	0.0817 ***	0.1988 ***	-0.0409 ***	1	0.4916 ***	-0.0873 ***
NAnalyst	-0.1207 ***	-0.0195 **	0.1038 ***	0.1787 ***	0.5033 ***	1	-0.0857 ***
Accruals	-0.0391 ***	-0.0763 ***	0.0829 ***	0.0348 ***	-0.0900 ***	-0.0865 ***	1

This table presents correlations among the variables used in the main tests. The sample is 12,534 firm-years. Pearson (Spearman) correlations are presented above (below) the diagonal. Variable definitions are presented in Appendix A. ***, **, and *, indicate significance (two-tailed) at the 1%, 5% and 10% levels, respectively.

Table 4: Association between Foreign Operations and Havens and Analysts' Implicit ETR Forecast Error

DV: Median consensus absolute implicit ETR forecast error	Coefficient t-stat					
	(1)		(2)		(3)	
Intercept	0.1756	***	0.2575	***	0.2548	***
	6.72		8..92		8.87	
MNC	**0.0235**	***	**0.0427**	***		
	2.57		**4.01**			
MNC_Non					**0.0480**	***
					3.16	
MNC_Haven					**0.0404**	***
					3.54	
Size	-0.0148	***	-0.0266	***	-0.0262	***
	-4.98		-7.73		-7.54	
MtoB	-0.0034	***	-0.0033	***	-0.0033	***
	-4.32		-3.35		-3.54	
NAnalyst	-0.0012	**	-0.0010		-0.0010	
	-1.98		-1.54		-1.50	
Accruals	-0.1538	**	-0.3234	***	-0.3228	***
	-2.06		-3.44		-3.43	
LagFE	0.3829	***	0.2285	***	0.2284	***
	7.15		7.98		7.98	
	n = 12,534		n = 10,502		n = 10,502	
Year Fixed Effects	Yes		Yes		Yes	

This table presents results from the test of Model 2, regressing the implicit absolute ETR forecast error on *MNC* and a set of control variables known to affect analyst forecast error, in Column 1. Column 2 presents results from the test regressing the implicit absolute ETR forecast error on *MNC_Non* and *MNC_Haven* and a set of control variables known to affect analyst forecast error. Columns 2 and 3 are run on a smaller sample due to limitations in the Haven data. *MNC* takes the value of 1 for a U.S. firm with foreign operations and 0 for domestic-only firms. *MNC_Non* takes the value of 1 for a U.S. firm with foreign operations that are not in a haven country and 0 otherwise. *MNC_Haven* takes the value of 1 for a U.S. firm with foreign operations in one or more haven countries, and 0 otherwise. All other variable definitions are presented in Appendix A. Year fixed effects are included. All standard errors are robust and clustered by firm. ***, **, and *, indicate significance (two-tailed) at the 1%, 5% and 10% levels, respectively.

Table 5: Association between Foreign Operations and Havens and ETR Persistence

	Coefficient t-stat		Coefficient t-stat	
DV: ETR_{t+1}				
	(1)		(2)	
Intercept	0.0895	***	0.0895	***
	10.21		8.73	
ETR_t	0.7444	***	0.7396	***
	36.64		30.14	
MNC	0.0503	***		
	5.83			
ETR_t*MNC	**-0.1922**	***		
	-7.14			
MNC_Non			0.0452	***
			3.20	
ETR_t*MNC_Non			**-0.1473**	***
			-3.54	
MNC_Haven			0.0479	***
			4.32	
ETR_t*MNC_Haven			**-0.1895**	***
			-5.58	
	n = 12,534		n = 10,502	
Year Fixed Effects	Yes		Yes	

This table presents results from the test of Model 3, testing the impact of *MNC* on the persistence of implicit actual ETR, in Column 1. Column 2 presents results testing the impact of *MNC_Non* and *MNC_Haven* on the persistence of implicit actual ETR. This test is run on the smaller sample due to limitations in the haven data. *MNC* takes the value of 1 for a U.S. firm with foreign operations and 0 otherwise. *MNC_Non* takes the value of 1 for a U.S. firm with foreign operations that are not in a haven country and 0 otherwise. *MNC_Haven* takes the value of 1 for a U.S. firm with foreign operations in one or more haven countries, and 0 otherwise. Year fixed effects are included. All standard errors are robust and clustered by firm. ***, **, and *, indicate significance (two-tailed) at the 1%, 5% and 10% levels, respectively.

Table 6: Association between Foreign Operations and Havens and Management Forecast Likelihood and Accuracy

Panel A: Likelihood of Management Earnings Forecast

DV: Management EPS Forecast Issuance

	Coefficient z-stat		Coefficient z-stat	
	(1)		(2)	
Intercept	1.0180	***	0.4069	**
	7.25		2.35	
MNC	**0.5861**	***		
	9.41			
MNC_Non			**0.4200**	***
			5.23	
MNC_Haven			**0.7750**	***
			10.41	
Size	-0.0770	***	0.0275	
	-4.30		1.16	
MtoB	0.0004		-0.0005	
	0.08		-0.09	
NAnalyst	0.0707	***	0.0474	***
	13.79		7.51	
Loss	-1.504	***	-1.2810	***
	-20.83		-16.66	
	n = 29,627		n = 20,108	
Year Fixed Effects	Yes		Yes	
	F-test of MNC_Non = MNC_Haven, p-value = 0.0000			

Continued on next page.

Panel B: Accuracy of Management Earnings Forecast

DV: Management EPS Forecast Error

	Coefficient t-stat	Coefficient t-stat	
	(1)	(2)	
Intercept	184.8	-0.2433	**
	1.00	-2.02	
MNC	**63.76**		
	1.00		
MNC_Non		**-0.0137**	
		-0.19	
MNC_Haven		**0.1848**	
		1.12	
Size	-30.23	0.0901	**
	-1.00	2.47	
MtoB	-2.338	-0.0350	
	-1.00	-0.80	
NAnalyst	-1.319	0.0557	
	-0.96	0.83	
Loss	-73.57	0.8231	***
	-0.99	5.47	
	n = 10,909	n = 8,489	
Year Fixed Effects	Yes	Yes	

This table presents results of tests of management's likelihood to issue earnings forecast and manager earnings forecast accuracy. Panel A presents results from the test of Model 4, to test the likelihood of management issuing an EPS forecast as impacted by *MNC* and a set of control variables known to affect the propensity for voluntary disclosure, in Column 1. Column 2 presents results testing the likelihood of management issuing an EPS forecast as impacted by *MNC_Non* and *MNC_Haven* and a set of control variables known to affect the propensity for voluntary disclosure. Column 2 is run on a smaller sample due to limitations in the Haven data. Panel B presents results testing the effect of *MNC* and *MNC_Non* and *MNC_Haven* on the accuracy of management's earnings forecasts. *MNC* takes the value of 1 for a U.S. firm with foreign operations and 0 for domestic-only firms. *MNC_Non* takes the value of 1 for a U.S. firm with foreign operations that are not in a haven country and 0 otherwise. *MNC_Haven* takes the value of 1 for a U.S. firm with foreign operations in one or more haven countries, and 0 otherwise. All other variable definitions are presented in Appendix A. Year fixed effects are included. Standard errors are robust and clustered by firm. ***, **, and *, indicate significance (two-tailed) at the 1%, 5% and 10% levels, respectively.

Table 7: Association between Loss and Analysts' Implicit ETR Forecast Error

Panel A: Loss Firms

DV: Median consensus absolute implicit ETR forecast error

	Coefficient t-stat	
Intercept	0.1396	***
	5.12	
MNC	0.0218	**
	2.49	
Loss	0.0618	**
	2.08	
MNC*Loss	**0.0961**	**
	2.11	
Size	-0.0102	***
	-3.16	
MtoB	-0.0035	***
	-4.38	
NAnalyst	-0.0013	**
	-2.07	
Accruals	-0.1214	*
	-1.65	
LagFE	0.3690	***
	6.64	
	n = 12,534	
Year Fixed Effects	Yes	

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Panel B: Foreign versus Domestic Loss

DV: Median consensus absolute implicit ETR forecast error

	Coefficient t-stat	
Intercept	0.1986	***
	5.21	
DomesticLoss	**0.1197**	***
	5.38	
ForeignLoss	**0.0571**	***
	2.85	
BothLoss	**0.2012**	***
	4.33	
Size	-0.0204	***
	-4.77	
MtoB	-0.0017	*
	-1.65	
NAnalyst	-0.0005	
	-0.69	
Accruals	-0.1551	
	-1.19	
LagFE	0.3747	***
	5.87	
	n = 7,337	
Year Fixed Effects	Yes	

F-test of DomesticLoss = ForeignLoss, p-value = 0.0286

F-test of DomesticLoss = BothLoss, p-value = 0.1222

F-test of ForeignLoss = BothLoss, p-value = 0.0042

This table presents results of the effect of firm loss on the implicit absolute ETR forecast error. Panel A tests loss overall on the full sample of domestic and multinational firms. Panel B uses the sample of multinational firms to test the difference between domestic loss, foreign loss, and a loss both domestically and foreign. *MNC* takes the value of 1 for a U.S. firm with foreign operations and 0 for domestic-only firms. *DomesticLoss* takes a value of 1 for firms with pre-tax domestic income less than 0 but pre-tax foreign income greater than 0. *ForeignLoss* takes a value of 1 for firms with domestic pre-tax income greater than 0 but foreign pre-tax inome less than 0. *BothLoss* takes a value of 1 for firms with both domestic and foreign pre-tax income less than 0. All other variable definitions are presented in Appendix A. Year fixed effects are included. All standard errors are robust and clustered by firm. ***, **, and *, indicate significance (two-tailed) at the 1%, 5% and 10% levels, respectively.

Table 8: Cumulative Abnormal Returns

DV: Standardized market-adjusted 3-day cumulative abnormal returns

	Coefficient t-stat			
	(1)	(2)	(3)	(4)
Intercept	-0.1452	-0.1461	-0.1910	-0.2379
	-0.68	-0.69	-0.89	-1.08
EPS_FE	**0.1134** **			
	2.52			
Tax_FE		**0.1265** **	0.2529 **	0.0715
		1.99	2.04	0.73
NonTax_FE		**0.1140** **	0.1497 ***	0.1251 **
		2.52	3.13	2.35
MNC			0.1170 **	
			2.52	
MNC*Tax_FE			**-0.1527**	
			-1.10	
MNC*NonTax_FE			**-0.0404**	
			-0.56	
MNC_Non				-0.0004
				-0.01
MNC_Non*Tax_FE				**0.179**
				0.68
MNC_Non*NonTax_FE				**0.0762**
				0.70
MNC_Haven				0.0819
				1.47
MNC_Haven*Tax_FE				**0.1053**
				0.80
MNC_Haven*NonTax_FE				**0.0036**
				0.05
Size	0.0178	0.0180	0.0112	0.0191
	1.41	1.43	0.86	1.33
MtoB	0.0083	0.0083	0.0082	0.0078
	1.54	1.53	1.52	1.32
Momentum	-3.1027	-3.1012	-3.1050	-2.2402
	-1.38	-1.38	-0.89	-0.87
	n = 10,761	n = 10,761	n = 10,761	n = 8,694
Year Fixed Effects	Yes	Yes	Yes	Yes

	F-test of (2): Tax_FE = NonTax_FE, p-value = 0.7531
	F-test of (3): Tax_FE = NonTax_FE, p-value = 0.2843
	F-test of (3): (Tax_FE+MNC*Tax_FE) = (NonTax_FE+MNC*NonTax_FE), p-value = 0.7922

This table presents results from the tests of Models 5 and 7. Column 1 reports results of the test of the market response to analyst EPS forecast error. Column 2 presents results testing the market response to the two components of earnings forecast error: non-tax earnings forecast error (*NonTax_FE*) and tax forecast error (*Tax_FE*). Column 3 present results of the test of the market response to the two components of the earnings forecast error interacted with *MNC.* Column 4 present results of the test of the market response to the two components of the earnings forecast error interacted with *MNC_Non* and *MNC_Haven*. Column 4 is run on a smaller sample due to limitations in the Haven data. The dependent variable is the standardized 3-day market-adjusted returns centered on the earnings announcement date. *MNC* takes the value of 1 for a U.S. firm with foreign operations and 0 for domestic-only firms. *MNC_Non* takes the value of 1 for a U.S. firm with foreign operations that are not in a haven country and 0 otherwise. *MNC_Haven* takes the value of 1 for a U.S. firm with foreign operations in one or more haven countries, and 0 otherwise. All other variable definitions are presented in Appendix A. All standard errors are robust and clustered by firm. ***, **, and *, indicate significance (two-tailed) at the 1%, 5% and 10% levels, respectively.